

## **RAW SEQUENCE LISTING**

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Application Serial Number: 10/535,667  
Source: 1Fw9  
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**RAW SEQUENCE LISTING**  
**PATENT APPLICATION: US/10/535,667**

**DATE: 03/06/2006**  
**TIME: 12:01:48**

**Input Set : A:\PTO.TS.txt**  
**Output Set: N:\CRF4\03062006\J535667.raw**

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3 <110> APPLICANT: IMAMURA, Hiromi
4      YOSHIDA, Masasuke
5      YOKOYAMA, Ken
7 <120> TITLE OF INVENTION: A Rotary Motor molecule V1-ATPase
9 <130> FILE REFERENCE: 2005_0822A/WMC/00653
11 <140> CURRENT APPLICATION NUMBER: US 10/535,667
12 <141> CURRENT FILING DATE: 2005-05-19
14 <150> PRIOR APPLICATION NUMBER: JP2002-337212
15 <151> PRIOR FILING DATE: 2002-11-20
17 <150> PRIOR APPLICATION NUMBER: PCT/JP2003/012983
18 <151> PRIOR FILING DATE: 2003-10-09
20 <160> NUMBER OF SEQ ID NOS: 5
22 <170> SOFTWARE: PatentIn Ver. 2.1
24 <210> SEQ ID NO: 1
25 <211> LENGTH: 4199
26 <212> TYPE: DNA
27 <213> ORGANISM: Thermus thermophilus
29 <220> FEATURE:
30 <221> NAME/KEY: CDS
31 <222> LOCATION: (1)..(318)
33 <220> FEATURE:
34 <221> NAME/KEY: CDS
35 <222> LOCATION: (334)..(2067)
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38 <221> NAME/KEY: CDS
39 <222> LOCATION: (2081)..(3514)
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42 <221> NAME/KEY: CDS
43 <222> LOCATION: (3528)..(4196)
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47 Val Arg Met Ala Val Ile Ala Asp Pro Glu Thr Ala Gln Gly Phe Arg
48      1          5           10          15
50 ctc gcg ggc ctc gag ggc tac ggg gcc tct tcg gcg gag gac gca 96
51 Leu Ala Gly Leu Glu Gly Tyr Gly Ala Ser Ser Ala Glu Glu Ala Gln
52      20         25           30
54 agc ctc ctg gaa acc ctc gtg gag cgg ggc ggc tac gcc ctg gtg gca 144
55 Ser Leu Leu Glu Thr Leu Val Glu Arg Gly Gly Tyr Ala Leu Val Ala
56      35         40           45
58 gtg gac gag gcg ctc ctc ccc gac ccc gag cgg gcg gtg gag cgc ctc 192
59 Val Asp Glu Ala Leu Leu Pro Asp Pro Glu Arg Ala Val Glu Arg Leu
60      50         55           60
62 atg cgg ggc agg gac ctc ccc gtg ctc ctg ccc atc gcg ggg ctg aag 240

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63	Met Arg Gly Arg Asp Leu Pro Val Leu Leu Pro Ile Ala Gly Leu Lys				
64	65	70	75	80	
66	gag gcc ttc cag ggg cac gac gtg gaa ggc tac atg cgg gag ctg gtg	288			
67	Glu Ala Phe Gln Gly His Asp Val Glu Gly Tyr Met Arg Glu Leu Val				
68	85	90	95		
70	agg aag acc atc ggc ttt gac atc aag ctg tagaatggag ggacg atg atc	339			
71	Arg Lys Thr Ile Gly Phe Asp Ile Lys Leu		Met Ile		
72	100	105			
74	caa ggg gtg atc cag aag atc gcg ggc ccg gcg gtg atc gcc aag ggc	387			
75	Gln Gly Val Ile Gln Lys Ile Ala Gly Pro Ala Val Ile Ala Lys Gly				
76	110	115	120		
78	atg ctc ggg gcc cgc atg tac gac atc tgc aag gtg ggc gaa gag ggc	435			
79	Met Leu Gly Ala Arg Met Tyr Asp Ile Cys Lys Val Gly Glu Glu Gly				
80	125	130	135	140	
82	ctc gtg ggc gag atc atc cgc ctg gac ggg gac acg gcc ttc gtc cag	483			
83	Leu Val Gly Glu Ile Ile Arg Leu Asp Gly Asp Thr Ala Phe Val Gln				
84	145	150	155		
86	gtc tac gag gac acc tcg ggc cta aag gtg ggg gag ccc gtg gtc tcc	531			
87	Val Tyr Glu Asp Thr Ser Gly Leu Lys Val Gly Glu Pro Val Val Ser				
88	160	165	170		
90	acg ggg ctt ccc ttg gcg gtg gag ctc ggc ccc ggg atg ctg aac ggc	579			
91	Thr Gly Leu Pro Leu Ala Val Glu Leu Gly Pro Gly Met Leu Asn Gly				
92	175	180	185		
94	atc tac gac ggc atc cag cgc ccc ctg gag cgc atc cgg gag aag acg	627			
95	Ile Tyr Asp Gly Ile Gln Arg Pro Leu Glu Arg Ile Arg Glu Lys Thr				
96	190	195	200		
98	ggg atc tac atc acc cgg ggc gtg gtg gtc cac gcc ctg gac cgg gag	675			
99	Gly Ile Tyr Ile Thr Arg Gly Val Val Val His Ala Leu Asp Arg Glu				
100	205	210	215	220	
102	aag aag tgg gcc tgg acg ccc atg gtc aag ccc ggg gac gag gtg cgg	723			
103	Lys Lys Trp Ala Trp Thr Pro Met Val Lys Pro Gly Asp Glu Val Arg				
104	225	230	235		
106	ggg ggt atg gtc ctg ggc acg gtg ccc gag ttc ggc ttc acc cac aag	771			
107	Gly Gly Met Val Leu Gly Thr Val Pro Glu Phe Gly Phe Thr His Lys				
108	240	245	250		
110	atc ctg gta ccc ccg gac gtg cgg ggc cgg gtc aag gag gtg aag ccc	819			
111	Ile Leu Val Pro Pro Asp Val Arg Gly Arg Val Lys Glu Val Lys Pro				
112	255	260	265		
114	gcc ggg gag tac acc gtg gag gag ccg gtg gtg gtc ctc gag gac ggc	867			
115	Ala Gly Glu Tyr Thr Val Glu Glu Pro Val Val Val Leu Glu Asp Gly				
116	270	275	280		
118	acc gag ctc aag atg tac cac acc tgg ccc gtt cgc cgg gcg agg ccc	915			
119	Thr Glu Leu Lys Met Tyr His Thr Trp Pro Val Arg Arg Ala Arg Pro				
120	285	290	295	300	
122	gtg caa agg aag ctt gac ccc aac acc ccc ttc ctc acg ggg atg cgc	963			
123	Val Gln Arg Lys Leu Asp Pro Asn Thr Pro Phe Leu Thr Gly Met Arg				
124	305	310	315		
126	atc ctg gac gtc ctc ttc ccc gtg gcc atg ggg ggc acc gcc gcc atc	1011			
127	Ile Leu Asp Val Leu Phe Pro Val Ala Met Gly Gly Thr Ala Ala Ile				

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128	320	325	330	
130	cct ggg ccc ttc ggc agc ggc aag acc gtg acc cag cag tcc ctg gcc			1059
131	Pro Gly Pro Phe Gly Ser Gly Lys Thr Val Thr Gln Gln Ser Leu Ala			
132	335	340	345	
134	aag tgg tcc aac gcc gac gtg gtg gtc tac gtg ggc tgc ggg gag cgg			1107
135	Lys Trp Ser Asn Ala Asp Val Val Val Tyr Val Gly Cys Gly Glu Arg			
136	350	355	360	
138	ggg aac gag atg acc gac gtg ctc gtg gag ttc ccc gag ctc acc gac			1155
139	Gly Asn Glu Met Thr Asp Val Leu Val Glu Phe Pro Glu Leu Thr Asp			
140	365	370	375	380
142	ccc aag acg ggg ggg ccc ttg atg cac cgc acc gtc ctc atc gcc aac			1203
143	Pro Lys Thr Gly Pro Leu Met His Arg Thr Val Leu Ile Ala Asn			
144	385	390	395	
146	acc tcc aac atg ccc gtg gcc cgcc gag gcc agc atc tac gtg ggc			1251
147	Thr Ser Asn Met Pro Val Ala Ala Arg Glu Ala Ser Ile Tyr Val Gly			
148	400	405	410	
150	gtg acc atc gcc gag tac ttc cgc gac cag ggc ttc tcc gtg gcc ctc			1299
151	Val Thr Ile Ala Glu Tyr Phe Arg Asp Gln Gly Phe Ser Val Ala Leu			
152	415	420	425	
154	atg gcc gac tcc acg agc cgc tgg gcc gag gct ttg cgc gag atc tct			1347
155	Met Ala Asp Ser Thr Ser Arg Trp Ala Glu Ala Leu Arg Glu Ile Ser			
156	430	435	440	
158	agc cgc ctc gag gag atg ccc gcc gag gag ggc tac ccg ccc tac ctc			1395
159	Ser Arg Leu Glu Glu Met Pro Ala Glu Glu Gly Tyr Pro Pro Tyr Leu			
160	445	450	455	460
162	gcc gcc agg ctc gcc gcc ttc tac gag cgg gcg ggc aag gtc atc acc			1443
163	Ala Ala Arg Leu Ala Ala Phe Tyr Glu Arg Ala Gly Lys Val Ile Thr			
164	465	470	475	
166	ctg ggc ggc gag gag ggg gcg gtg acc atc gtg ggg gcc gtc tcc ccg			1491
167	Leu Gly Gly Glu Glu Gly Ala Val Thr Ile Val Gly Ala Val Ser Pro			
168	480	485	490	
170	ccg ggc ggc gac atg tcc gag ccc gtg acc cag tcc acc ttg agg atc			1539
171	Pro Gly Gly Asp Met Ser Glu Pro Val Thr Gln Ser Thr Leu Arg Ile			
172	495	500	505	
174	gtg ggg gcc ttc tgg cgg ctt gac gcc tcc ctg gcc ttc cgc cgc cac			1587
175	Val Gly Ala Phe Trp Arg Leu Asp Ala Ser Leu Ala Phe Arg Arg His			
176	510	515	520	
178	tcc ccc gcc atc aac tgg aac ggc tcc tac agc ctc ttc acc tcc gcc			1635
179	Phe Pro Ala Ile Asn Trp Asn Gly Ser Tyr Ser Leu Phe Thr Ser Ala			
180	525	530	535	540
182	ctt gac ccc tgg tac cgg gag aac gtg gcc gag gac tac ccc gag ctc			1683
183	Leu Asp Pro Trp Tyr Arg Glu Asn Val Ala Glu Asp Tyr Pro Glu Leu			
184	545	550	555	
186	cgc gac gcc atc tcc gag ctt ttg cag cgg gag ggc ggc ctc cag gag			1731
187	Arg Asp Ala Ile Ser Glu Leu Leu Gln Arg Glu Ala Gly Leu Gln Glu			
188	560	565	570	
190	atc gtc cag ctc gtg ggg ccg gac gcc ctc cag gac gcc gag cgc ctc			1779
191	Ile Val Gln Leu Val Gly Pro Asp Ala Leu Gln Asp Ala Glu Arg Leu			
192	575	580	585	

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194	gtc	att	gag	gtg	ggc	cgg	atc	atc	cgc	gag	tac	ttc	ctg	cag	cag	aac	1827	
195	Val	Ile	Glu	Val	Gly	Arg	Ile	Ile	Arg	Glu	Asp	Phe	Leu	Gln	Gln	Asn		
196	590				595							600						
198	gcc	tac	cac	gag	gtg	gac	gcc	tac	tgc	tcc	atg	aag	aag	gcc	tac	ggg	1875	
199	Ala	Tyr	His	Glu	Val	Asp	Ala	Tyr	Cys	Ser	Met	Lys	Lys	Ala	Tyr	Gly		
200	605				610						615		620					
202	atc	atg	aag	atg	atc	ctc	gcc	ttc	tac	aag	gag	gag	gag	gag	gcc	atc	1923	
203	Ile	Met	Lys	Met	Ile	Leu	Ala	Phe	Tyr	Lys	Glu	Ala	Glu	Ala	Ala	Ile		
204					625					630			635					
206	aag	cgg	ggg	gtt	tcc	ata	gac	gag	atc	ctg	cag	ctc	ccc	gtt	ctg	gag	1971	
207	Lys	Arg	Gly	Val	Ser	Ile	Asp	Glu	Ile	Leu	Gln	Leu	Pro	Val	Leu	Glu		
208					640					645			650					
210	cgc	atc	ggc	cgc	gcc	cgc	tac	gtg	agc	gag	gag	ttc	ccc	gcc	tac	2019		
211	Arg	Ile	Gly	Arg	Ala	Arg	Tyr	Val	Ser	Glu	Glu	Glu	Phe	Pro	Ala	Tyr		
212					655				660			665						
214	ttt	gag	gag	gcc	atg	aag	gag	atc	cag	ggg	gcc	ttc	aag	gcc	ctg	gcc	2067	
215	Phe	Glu	Glu	Ala	Met	Lys	Glu	Ile	Gln	Gly	Ala	Phe	Lys	Ala	Leu	Ala		
216					670				675			680						
218	taa	agg	ggg	ggg	aa	atg	gac	ctt	ctg	aag	aag	gag	ta	acg	ggc	atc	acc	
219	Met	Asp	Leu	Leu	Lys	Lys	Glu	Tyr	Thr	Gly	Ile	Thr					2116	
220					685				690			695						
222	tac	atc	tcg	ggg	cct	ctt	ctc	ttc	gtg	gag	aac	gcc	aag	gac	ctg	gcc	2164	
223	Tyr	Ile	Ser	Gly	Pro	Leu	Leu	Phe	Val	Glu	Asn	Ala	Lys	Asp	Leu	Ala		
224					700				705			710						
226	tac	ggg	gcc	atc	gtg	gac	atc	aag	gac	ggc	acg	ggc	cgg	gtc	cgc	ggc	2212	
227	Tyr	Gly	Ala	Ile	Val	Asp	Ile	Lys	Asp	Gly	Thr	Gly	Arg	Val	Arg	Gly		
228					715				720			725						
230	ggc	cag	gtg	att	gag	gtc	tcc	gag	gag	tac	gcc	gtc	atc	cag	gtg	ttt	2260	
231	Gly	Gln	Val	Ile	Glu	Val	Ser	Glu	Glu	Tyr	Ala	Val	Ile	Gln	Val	Phe		
232					730				735			740						
234	gag	gaa	acc	act	ggg	ctg	gac	ctg	gcc	acc	acc	acg	ctg	gtg	agc	ctg	gtg	2308
235	Glu	Glu	Thr	Thr	Gly	Leu	Asp	Leu	Ala	Thr	Thr	Ser	Val	Ser	Leu	Val		
236					745				750			755			760			
238	gag	gac	gtg	gcc	cgg	ctt	ggg	gtc	tcc	aag	gag	atg	ctg	ggc	cgc	cgc	2356	
239	Glu	Asp	Val	Ala	Arg	Leu	Gly	Val	Ser	Lys	Glu	Met	Leu	Gly	Arg	Arg		
240					765				770			775						
242	ttc	aac	ggc	atc	ggc	aag	ccc	ata	gac	ggc	ctg	ccg	ccc	atc	acc	ccg	2404	
243	Phe	Asn	Gly	Ile	Gly	Lys	Pro	Ile	Asp	Gly	Leu	Pro	Pro	Ile	Thr	Pro		
244					780				785			790						
246	gag	aag	cg	ctc	ccc	atc	acc	ggc	ctt	ccc	tta	aac	ccc	gtg	gcc	cg	2452	
247	Glu	Lys	Arg	Leu	Pro	Ile	Thr	Gly	Leu	Pro	Leu	Asn	Pro	Val	Ala	Arg		
248					795				800			805						
250	agg	aag	ccg	gag	cag	tcc	atc	cag	ggc	atc	tcc	acc	att	gac	gtg		2500	
251	Arg	Lys	Pro	Glu	Gln	Phe	Ile	Gln	Thr	Gly	Ile	Ser	Thr	Ile	Asp	Val		
252					810				815			820						
254	atg	aac	acc	ctg	cg	gg	gg	cag	aag	ctt	ccc	atc	ttc	tcc	ggc	tcg	2548	
255	Met	Asn	Thr	Leu	Val	Arg	Gly	Gln	Lys	Leu	Pro	Ile	Phe	Ser	Gly	Ser		
256					825				830			835			840			
258	ggg	ctt	ccc	gcc	aac	gag	atc	gcc	gcc	cag	atc	gcc	cgc	cag	gcc	acg	2596	

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259 Gly Leu Pro Ala Asn Glu Ile Ala Ala Gln Ile Ala Arg Gln Ala Thr			
260 845	850	855	
262 gtg cgc ccc gac ctc tcc ggg gag ggg gag aag gag gag ccc ttc gcc	2644		
263 Val Arg Pro Asp Leu Ser Gly Glu Gly Lys Glu Glu Pro Phe Ala			
264 860	865	870	
266 gtg gtc ttc gcc gcc atg ggg atc acg cag cggttcc tac ttc	2692		
267 Val Val Phe Ala Ala Met Gly Ile Thr Gln Arg Glu Leu Ser Tyr Phe			
268 875	880	885	
270 atc cag gag ttt gag cgc acc ggg gcc ctg agc cgc tcc gtc ctc ttc	2740		
271 Ile Gln Glu Phe Glu Arg Thr Gly Ala Leu Ser Arg Ser Val Leu Phe			
272 890	895	900	
274 ctg aac aag gcg gac gac ccc acc att gag cgc atc ctc acc ccc cgc	2788		
275 Leu Asn Lys Ala Asp Asp Pro Thr Ile Glu Arg Ile Leu Thr Pro Arg			
276 905	910	915	920
278 atg gcc ctc acc gtg gcc gag tac ctg gcc ttt gag cac gac tac cac	2836		
279 Met Ala Leu Thr Val Ala Glu Tyr Leu Ala Phe Glu His Asp Tyr His			
280 925	930	935	
282 gtc ctc gtc atc acg gac atg acc aac tac tgc gag gcc ttg cgg	2884		
283 Val Leu Val Ile Leu Thr Asp Met Thr Asn Tyr Cys Glu Ala Leu Arg			
284 940	945	950	
286 gag atc ggg gcc gcc cgc gag gag atc ccg ggc cgc cgc ggt tac ccc	2932		
287 Glu Ile Gly Ala Ala Arg Glu Glu Ile Pro Gly Arg Arg Gly Tyr Pro			
288 955	960	965	
290 ggc tac atg tac acc gac ctg gcc acc atc tac gag cgc gcc ggg gtg	2980		
291 Gly Tyr Met Tyr Thr Asp Leu Ala Thr Ile Tyr Glu Arg Ala Gly Val			
292 970	975	980	
294 gtg gag ggg aag aag ggg agc gtg acc cag atc ccc atc ctc tcc atg	3028		
295 Val Glu Gly Lys Lys Gly Ser Val Thr Gln Ile Pro Ile Leu Ser Met			
296 985	990	995	1000
298 ccc gac gac gac cgc acc cac ccc atc ccc gac ctc acg ggc tac atc	3076		
299 Pro Asp Asp Asp Arg Thr His Pro Ile Pro Asp Leu Thr Gly Tyr Ile			
300 1005	1010	1015	
302 acc gag ggg cag atc cag ctc tcc ccg gag ctc cac cgc aag ggc atc	3124		
303 Thr Glu Gly Gln Ile Gln Leu Ser Arg Glu Leu His Arg Lys Gly Ile			
304 1020	1025	1030	
306 tac ccg ccc att gac ccc ttg ccc tcc ctc ccg ctc atg aac aac	3172		
307 Tyr Pro Pro Ile Asp Pro Leu Pro Ser Leu Ser Arg Leu Met Asn Asn			
308 1035	1040	1045	
310 ggc gtg ggc aag ggc aag acc ccg gag gac cac aag cag gtc tcc gac	3220		
311 Gly Val Gly Lys Gly Lys Thr Arg Glu Asp His Lys Gln Val Ser Asp			
312 1050	1055	1060	
314 cag ctc tac tcc gcc tac gcc aac ggg gtg gac atc ccg aag ctc gtg	3268		
315 Gln Leu Tyr Ser Ala Tyr Ala Asn Gly Val Asp Ile Arg Lys Leu Val			
316 1065	1070	1075	1080
318 gcc atc atc ggc gag gac gcc ctc acg gag aac gac cgc cgt tac ctc	3316		
319 Ala Ile Ile Gly Glu Asp Ala Leu Thr Glu Asn Asp Arg Arg Tyr Leu			
320 1085	1090	1095	
322 cag ttc gcc gac gcc ttt gaa ccg ttc atc aac cag ggg cag cag	3364		
323 Gln Phe Ala Asp Ala Phe Glu Arg Phe Phe Ile Asn Gln Gln Gln			

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